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Mag. oxide,112643	6.5824
Iron oxide (as bicarb.),005464	.3192
Sodium,014798	.8648
Potassium,	Trace	Trace
Lithium,	Trace	Trace
Sulphuric acid (SO_3), . . . . .	.566664	33.1141
Chlorine, . . . . .	.030788	1.7993
Silica, . . . . .	.020285	1.1851

The water from a well drilled last spring in the southeastern part of Davis county was recently analyzed in our laboratory with the following result:

	Grams per litre.	Grains per gal.
Calcium oxide (as bicarb.), . . . . .	.1328	7.7605
Magnesium oxide (as bicarb.), . . . . .	.00764	.4465
Calcium oxide (not carb.), . . . . .	.14843	8.6739
Magnesium oxide (not carb.), . . . . .	.16634	9.7205
Lithium,	Trace	Trace
Sodium, . . . . .	.05317	3.1017
Ferrous oxide (as bicarb.), . . . . .	.00333	.1946
Alumina, . . . . .	.02410	1.4083
Hydrogen sulphide (free), . . . . .	.03375	1.9620
Hydrogen sulphide (combined), . . . . .	.00850	.4967
Sulphuric acid (SO_3), . . . . .	.64117	37.4683
Chlorine, . . . . .	.01377	.8047
Phosphoric acid,	Trace	Trace
Iodine,	Trace	Trace
Boric acid,	Trace	Trace
Carbonic acid (combined), . . . . .	.01884	6.5886
Silica, . . . . .	.01502	.8774

Free carbonic acid not determined.

The well is 80 feet deep. The owner of the well states, that at a depth of about 60 feet a blowing noise was heard in the well, as though a cavity containing compressed gas had been tapped. He does not remember to have observed the odor of hydrogen sulphide at this time. The noise may have been due to the escape of this gas, but it does not seem probable.

In giving the analytical results, I have preferred to give the substances found, without combining them. Except in those cases where the compound may be precipitated by boiling, as in the case of the carbonates, only a shrewd guess can be made regarding the combination of the bases and the acids in such complex and dilute solutions.

[The following paper was received too late for a place upon the programme, but is here inserted as properly belonging to the proceedings of this meeting. It appears as received by Professor W. A. Kellerman, at whose request it was written.—SECRETARY.]

A CONTRIBUTION TO THE FLORA OF KANSAS—GRAMINEAL. (With Plates I, II and III.)

BY F. LAMSON SCRIBNER.

To PROF. W. A. KELLERMAN: I have examined the Kansas grasses contained in the package recently received from you, and I present herewith my determinations of the species. They are for the most part widely distributed in this country, and all save two of the genera—*Chloris* and *Munroa*—are described in Gray's Manual. Nearly double the number of species of grasses here enumerated probably occur within the limits of your State. The list is arranged according to the classification in Bentham and Hooker's *Genera Plantarum*.

8 and 30. *Paspalum setaceum*, Mx., Fl. I. 43; Nutt. Fl. Ark. 145; Gray's Man. 645; No. 802 of E. Hall's Texan collection.

9. *Panicum sanguinale*, L., Gray's Man. 646. (*Digitaria*, Beauv.; Nuttall, Fl. Ark. 145.)
53. *Panicum scoparium*, Lam., Thurber in Bot. Cal. II, p. 259. (*P. pauciflorum* of Gray's Man., p. 648, and probably also of Elliott, Nutt. Fl. Ark. 144.)
22. *Panicum virgatum*, L., Nutt. Fl. Ark. 144; Gray's Man. 647.
52. *Panicum laxiflorum*, Lam., Chapm. So. Flor. Suppl., p. 667; (*P. dichotomum*, L. var. 2, Chapm. So. Flor. 576.)
- 16 and 51. *Panicum Crus-galli*, L. Gray's Man. 649; Nutt. l. c. 144. Two forms are represented—one nearly awnless, and one with long awns and very rough glumes; (var. *hispidum*, Gray.)
63. *Setaria glauca*, P. B., Gray, l. c. 650; Lesq. Fl. Ark. 397.
15. *Cenchrus tribuloides*, L., Gray, l. c. 650; Nutt. l. c. 145.
14. *Spartina cynosuroides*, Willd., Gray's Man. 619.
2. *Tripsacum dactyloides*, Linn. f., Nutt. Fl. Ark. 144; Gray's Man. 650.
19. *Leersia Virginica*, Willd., Nutt. l. c. 153; Gray, l. c. 607.
11. *Andropogon provincialis*, Lam. Encycl. l. 376, 1783. (*Andropogon furcatus*. Muhl. in Willd. sp. 4, 919, 1797; Gram. 281, 1817; Lesq. Fl. Ark. 398; Gray's Man. 652.) In a letter from Prof. E. Häckel, of St. Poelton, Austria, who is now engaged in preparing a monograph on the *Andropogoneæ*, he says: "The *Andropogon furcatus*, Muhl., which grows sparingly in southern France, has an older synonym: *A. provincialis*, Lam., a fact which seems unknown to American botanists. I am not sure of their being fully identical, but there is certainly no specific difference between them."
10. *Andropogon scoparius*, Mx., Lesq. Fl. Ark. 398; Gray's Man. 652.
20. *Chrysopogon nutans*, Benth. (*Sorghum nutans*, Gray's Man. 652, *Andropogon nutans*, L., *Andropogon avenaceus*, Mx.; Nutt. Fl. Ark. 152.)
39. *Aristida oligantha*, Mx., Nutt. Fl. Ark. 135; Gray's Man. 618.
58. *Aristida fasciculata*, Torr. Ann. Lyc. N. Y. 2, 154, (1826.) (*A. Hookeri*, Trin.) No. 652 Hall and Harbour; No. 672 Powell; No. 336 Scribner, Montana coll.; 563 Fendler. This grass has been referred to *A. purpurea*, Nutt., but if it really be of that species—which, from seeing the two growing in the field and from the examination of a large number of specimens, I greatly doubt—Torrey's name takes precedence, as it is the earlier.
29. *Aristida purpurea*, Nutt. Fl. Ark. 1834, p. 143. This differs but a little from the genuine form of *A. purpurea*, as represented by No. 563 Lindheimer, and No. 768 E. Hall's Texan coll. It is apparently identical with No. 978 Fendler, (*Aristida longiseta*, Steud.,) and No. 476 E. Palmer (1877). *A. filipendula*, Buckl., is a rather larger form, but equally slender—not rigid like *A. fasciculata*—with a more numerously-flowered panicle and shorter awns. In order to fix more clearly the characters of Nuttall's plant, I will quote his excellent description of the species from the Trans. Am. Philos. Soc., vol. 5, (N. S.), 1837.
- "Panícula erectiuscula gracili; cal. valvulis remotis aristulatis apice bifidis; aristis capillaribus longissimus; foliis brevibus scabris. *Hab.*—on the grassy plains of Red river in arid situations; flowering in May. *Obs.*—perennial; leaves narrow, short and scabrous, ligule pilose; culm about one foot high, panicle many-flowered, a little spreading, branches capillary; flowers commonly in pairs, (after the manner of the genus,) bluish purple; one valve of the calyx, nearly double the length of the other, both bifid at the summit and shortly awned, the longer valve exceeding the corolla; awns equal, capillary nearly three times the length of the corolla and scabrous, corolla minutely stipitate."
- 13 and 40. *Muehlenbergia glomerata*, Trin., Gray's Man. 613.
49. *Muehlenbergia sylvatica*, Torr. and Gray, var. *gracilis*, Scribn. (n. var.) Panicles slender, like those of *M. diffusa*. It resembles somewhat *M. monticola*, Buckl., but in that species the empty glumes are much shorter than the floret, while in this they nearly equal it (exclusive of the awn), as in *M. sylvatica*. (Topeka, E. A. Popenoe.)

- 17 and 41. *Sporobolus cryptandrus*, Gray's Man. 610. (Agrostis and Vilfa, Torr.) No. 349 of my Montana collection.
- 42 and 54. *Agrostis alba*, L., Gray's Man. 612. *Agrostis alba*, var. *vulgaris*, Thurber in Bot. Calif. II, 272. (*A. vulgaris*, With.)
50. *Agrostis scabra*, Willd., Gray's Man. 611.
62. *Cinna arundinacea*, L., Nutt. Fl. Ark., p. 143; Gray's Man. 613. The specimens are slender, and have almost the habit of *C. pendula*, Trin., but they are at once distinguished from that species by the unequal outer glumes.
25. *Chloris verticillata*, Nutt. Fl. Ark. 150, and Trans. Am. Philos. Soc. vol. 5 (N. S.) 143. "Spicis plurimis verticillatis, radiatis, filiformibus; calicibus acuminatis bifloris; flosculis longe aristatis; gluma exteriore subbarbata; caule compresso. *Hab.*—On the sandy banks of the Arkansas, near Fort Smith, rare. Flowering in June. *Obs.*—Perennial. Culm compressed, branched from the base about 12 inches high; leaves pale green, narrowish, and flat; sheaths carinately compressed; stipules obsolete, hairy; spikes mostly verticillated in two series, the first aggregation consisting of from 7–9 spikes; spikes filiform and stellately spreading, pilose at the base, about 6 inches long; flowers (*spikelets*) unilateral, alternating in two rows; calyx (*empty glumes*) acuminate, two-flowered, one of the flowers perfect, the other neuter, the dorsal valves (*flowering glumes or lower palets*) of both gibbous, obtuse and awned, the awn more than twice the length of the flower, that of the hemaphrodite bearded; seed triangular, smooth and even; anthers 3; stigmas 2, brown. There are few grasses in America more curious and elegant. Its aspect is that of a tropical species." (Nuttall.)
27. *Schedonnardus Texanus*, Steudel, Syn. Gram. 146, (1855.) Upham, Flora, Minn. 169. (*Lepturus paniculatus*, Nutt., Gen. l. 81, 1818. Flora Ark. 152; Gray's Man. 637.) This grass belongs to the tribe Chlorideæ, and is allied to *Gymnopogon*, while the true *Lepturi*, of which we have no North-American species, excepting the sparingly introduced *L. incurvatus* and *L. filiformis*, belong in *Hordeæ*, between *Agropyrum* and *Hordeum*. *Lepturus Bolanderi*, Thurber, described by Dr. A. Gray in Proc. Am. Acad. Arts and Sci., p. 401, 1867, and by Prof. Thurber in Bot. Calif. II, 322, (Bolander, No. 4669; collected also in California by E. L. Greene, and in southern Oregon by Howell,) cannot be referred to either of the genera here named as they are characterized, nor is it referable to any of the allied genera in either groups. I am of the opinion that it constitutes an independent genus.
- 26 and 38. *Bouteloua oligostachya*, Torr., Gray's Man. 621. (*Atheropogon oligostachya*, Nutt. Gen. l. 78, Fl. Ark. 150.)
37. *Bouteloua hirsuta*, Lag., Gray's Man. 621.
12. *Bouteloua curtipendula*, Torr. in Emory's Rept. 1848, p. 153. (*Chloris curtipendula*, Mx., Fl. l. 59, 1803, *Bouteloua racemosa*, Lagasca, Varied. de Cienc., 1805, No. 22, 141.) The specimens belong to the var. *aristosa*, Gray.
18. *Triodia seslerioides*, Bentham, (*Poa seslerioides*, Mx., Fl. l. 68, 1803. *Tricuspid seslerioides*, Torr.; Gray's Man. 624. *Triodia cuprea*, Jacq., Eclog. Gram. 2, 21, t. 16, 1815. *Uralepsis cuprea*, Kth. Gram. l. 108, 313, t. 68.)
28. *Munroa squarrosa*, Torr., Pacific R. R. Rep. IV, 158. (*Crypsis squarrosa*, Nutt., Gen. l. 49.) In 1883, I found this grass growing near Fort Benton, Montana, the most northern point yet reported for its distribution.
- Koeleria cristata*, Pers.; Gray's Man. 625. This is a very common grass in all the region west of the Mississippi and in Montana, where I have heard it called "June grass." It often covers the extensive bench-lands in equal abundance with its associate, *Poa tenuifolia*. The species, as we have it, presents a variety of forms, some of which may prove good species. Upon the dry bench-lands, where the grass stands thinly, the radical leaves or those of the sterile shoots are short (2–3 inches) and strongly involute. In

other localities the narrow, radical leaves nearly equal the culm in length. Sometimes the leaves are nearly smooth, and again they are strongly pilose; in some Oregon specimens the lower sheaths are hirsute. The panicle, usually short and dense, is sometimes elongated (6 inches or more), with erect or ascending lower branches 1-2 inches long. The spikelets are from 2-5 fld., and vary in size from $1\frac{1}{2}$ -1 inches to 3-1 inches in length, with a proportional variation in width. The glumes are thin and membranous with broad scarious margins, nearly smooth and sharply acuminate or obtuse, strongly scabrous and firm in texture (sub-coriaceous). The outer or empty glumes are always unequal in size, and though generally of unequal length, they are sometimes equal or nearly so; usually shorter than the spikelet, they sometimes equal or even exceed it. In the typical plant the flowering glumes are very acute, often terminating in a short awn. In some of our forms, however, they are obtuse, while from California come samples in which the flowering glume is slightly notched at the tip, and the mid-nerve extends between the lobes as a short mucronate point. These Californian specimens also differ from all others examined in having the paleæ as long or even longer than their glumes*.

43. *Eatonia Pennsylvanica*, Gray's Man. 626. This and *E. obtusata*, Gray, which I also have from Kansas, vary a good deal in inflorescence and in the special characters of the spikelets, and intermediate forms occur making it difficult to distinguish the one from the other. In *E. obtusata* the spikelets are scarcely more than a line in length, florets very obtuse, and the second glume is broader than it is long, and saccate around the second floret. The panicle, usually erect and densely many-flowered, especially in western specimens, is sometimes nutant and loosely few-flowered. Specimens of this species are at hand from Massachusetts, New York, Pennsylvania, Illinois, Michigan, Belleville, (Canada,) Florida, Georgia, Louisiana, Texas, Kansas, Utah, Washington Territory, Arizona, and Montana.

E. Pennsylvanica is a taller and more robust species, with a larger and more open panicle, spikelets 2-3 in. long, florets longer and usually more pointed, sometimes even awned, while the second glume, although broad and obtuse, is not so broad in proportion to its length as in *E. obtusata*. It has about the same distribution.

Eragrostis major, Host. Gram. IV t. 24, 1809. *Megastachya Eragrostis*, Beauv. *E. poœoides*, var. *megalostachya*, Gray. Beauvois was not the author of *E. poœoides* as quoted by authors. This name does not occur in Beauvois's work, nor is it applied to the figure illustrating this species; it only appears in the index, without reference to any page of the book, nor to any previously published species. Beauvois's work, here referred to, was published in 1812, and even had he given this name—*E. poœoides*—Host's name would take precedence, it being the earlier. *E. minor* Host—*E. poœoides* of authors, not of Beauvois.

21. *Eragrostis pectinacea*, Gray's Man. 632, Lesq. Fl. Ark. 396.

34. *Eragrostis reptans*, Nees., Gray's Man. 631. (*Poa reptans*, Mich., Nutt. Fl. Ark. 146.)

*Nuttall, in the Herb. Acad. Nat. Sci. Phila., proposed several names for forms of this species. "K. glabrata," "K. Oregon" and "K. melanthera" are all *K. cristata*. "K. Arkansana" and "K. Montana" belong to *K. nitida*, Nutt. Gen. I 74. *K. tuberosa*, Nutt. Fl. Ark. 148; *K. cristata*, var. *gracilis*, Gray, a species which I think ought to be restored. It is distinguished from *K. cristata* by the smaller size of its spikelets, by its obtuse glumes, and especially by the much firmer (almost coriaceous) texture of its glumes. In the proposed variety of *K. nitida*—var. *Arkansana*—(*K. Arkansana*, Nutt. in herb.), the culms are stouter and more leafy; the leaves are flat and longer than in the species, the upper one 3-5 inches long; panicle elongated (3-6 inches), the erect or slightly spreading lower branches 1-2 inches long. Spikelets 3-4 fld., in texture resembling those of *K. nitida*; quite unlike those of *K. cristata*. 6. *K. nitida* Nutt. I 74. 48. *K. nitida*. (*K. tuberosa* Nutt. Fl. Ark. 148.) 47. *K. nitida* var. *Arkansana*. (*K. Arkansana*, Nutt. in herb.)

55. *Eragrostis tenuis*, Gray's Man., 2d ed. 564, and 5th ed. 632. (*Poa trichodes*, Nutt. Fl. Ark. 146.)
36. *Melica mutica*, Walt., var. *diffusa*, Gray's Man. 626. (*M. diffusa*, Pursh., *M. glabra*, Mx., Nutt. Fl. Ark. 148.)
59. *Uniola latifolia*, Mich., Nutt. Fl. Ark. 148, Gray's Man. 636. *Distichlis maritima*, Raf. var., *strictum*, Thurb. Bot. Calif., II 306. (*Uniola stricta*, Torr., *Uniola multiflora*, Nutt. Fl. Ark. 148. *Brizopyrum spicatum*, var. *strictum*, Gray.)
- 35, 36a, 44. *Poa flexuosa*, Muhl., Gray's Man. 630.
45. *Poa compressa*, L., Gray's Man. 629.
61. *Festuca elatior*, L., Gray, l. c. 634.
7. *Festuca tenella*, Willd., Gray, l. c. 633, Nutt. Fl. Ark. 141 (sub-var. *glaucua*.)
- 5, 32, 33. *Bromus*; the specimens are all probably *B. ciliatus*, L. They differ somewhat from the more eastern plant, but I am unable to separate them. Our North-American *Bromi* are as yet very imperfectly identified.
31. *Agropyrum glaucum*, R. & S., var. *occidentale*. Glumes narrower and more acute than in the European plant. This has been referred to *Triticum repens*, L., by most American authors, but it is abundantly distinct.
56. *Hordeum pusillum*, Nutt., Gen. I 87, Fl. Ark. 151. This species has been united with *H. nodosum*, L., (*H. pratense*, Huds.) by recent American authors, but it is well characterized by its broad outer glumes, as well as by its usually lower and more rigid habit of growth.
- 23, 24. *Elymus Canadensis*, L. Gray's Man. 639, Nutt. Fl. Ark. 151.

EXPLANATION OF PLATES.

PLATE I.—*Chloris verticillata*.

- Fig. 1. Habit of the species, reduced.
 Fig. 2. Spikelet, much enlarged.
 Fig. 3. Same with the two lower glumes removed.
 Fig. 4. The stipitate imperfect floret.

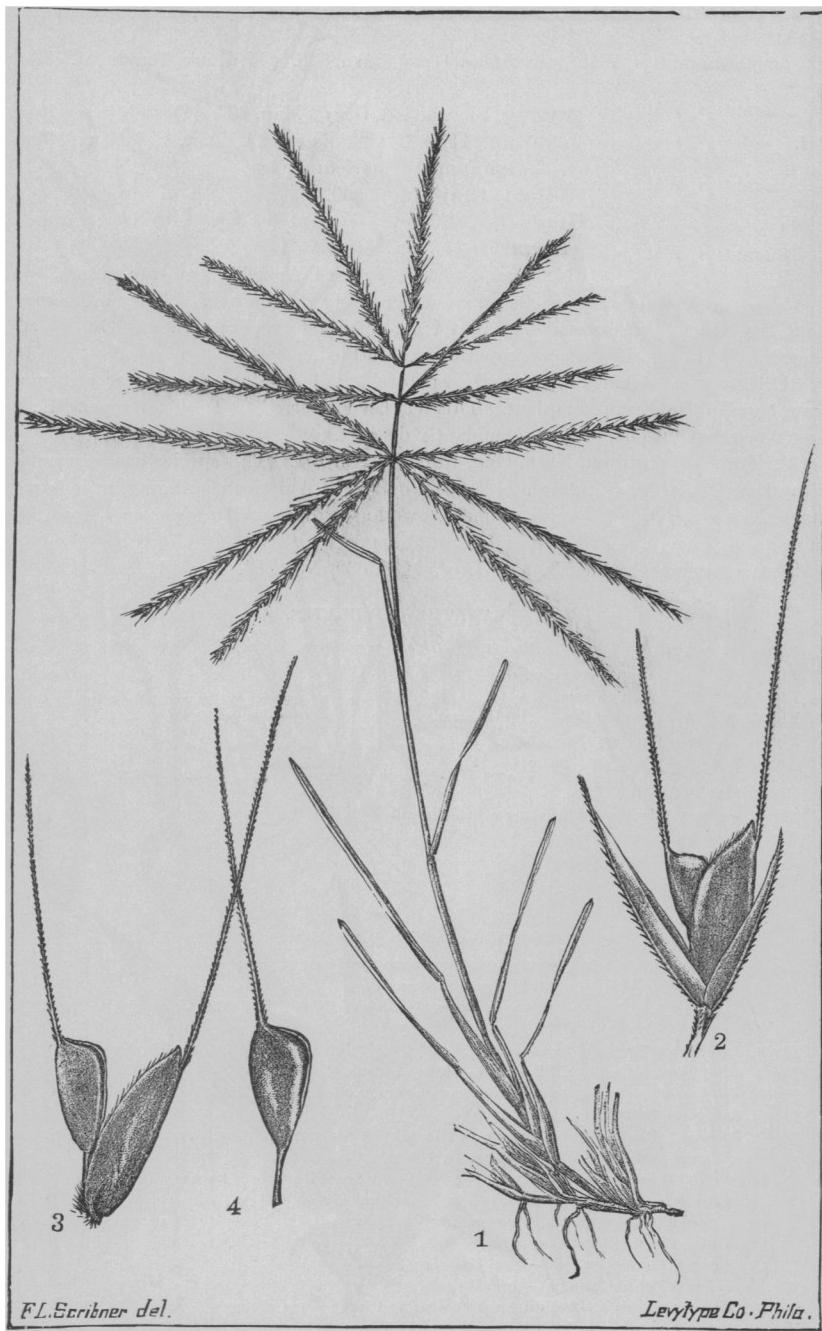
PLATE II.—*Munroa squarrosa*.

- Fig. 1. Habit of plant.
 Fig. 2. Cluster of leaves terminating a branch and inclosing the inflorescence, enlarged (original).
 Fig. 3. Spikelet, much enlarged.
 Fig. 4, 5. The lower glumes.
 Fig. 6. Flowering glume.
 Fig. 7. Palea.
 Fig. 8. Pistil. 9. Seed.

PLATE III.—*On Kœleria and Eatonia*.

- Fig. 1. Spikelet of *Kœleria cristata*, from European specimen.
 Fig. 2. " " " *cristata*, from Montana.
 Fig. 3. " " " from specimen in Herb. Acad. Nat. Sci., Phila., ticketed by Nuttall "*K. Arkansana*."
 Fig. 4. Spikelet of *Kœleria*, from specimen coll. by Bigelow, probably in New Mexico.
 Fig. 5. " " " *nitida*, Nutt.—from Kansas.
 Fig. 6. " " " from Californian specimen collected by Miss Scott.
 Fig. 7. *Eatonia*.—Spikelets three-fold.
 Fig. 8. *Eatonia*.—Panicle nutant, open and loosely few-flowered. A well-marked form with unusually large and three-fold spikelets.
 Fig. 9. *Eatonia*.—Paleæ remarkably long, equaling or exceeding their glumes.
 Fig. 10. *Eatonia*.—Paleæ much shorter than their glumes.
 Fig. 11. *Eatonia Pennsylvanica*, from specimen supposed by Dr. Vasey to be a hybrid between *E. Pennsylvanica* and *Trisetum palustre*.
 Fig. 12. *Eatonia Pennsylvanica*—from Louisiana.
 Fig. 13. *Eatonia Pennsylvanica*—from Kansas.
 Fig. 14. *Eatonia obtusata*—with unusually long and large lower glume.
 Fig. 15. *Eatonia obtusata*—from Kansas, genuine form.

(These figures are all enlarged to the same scale.)



F.L.Scribner del.

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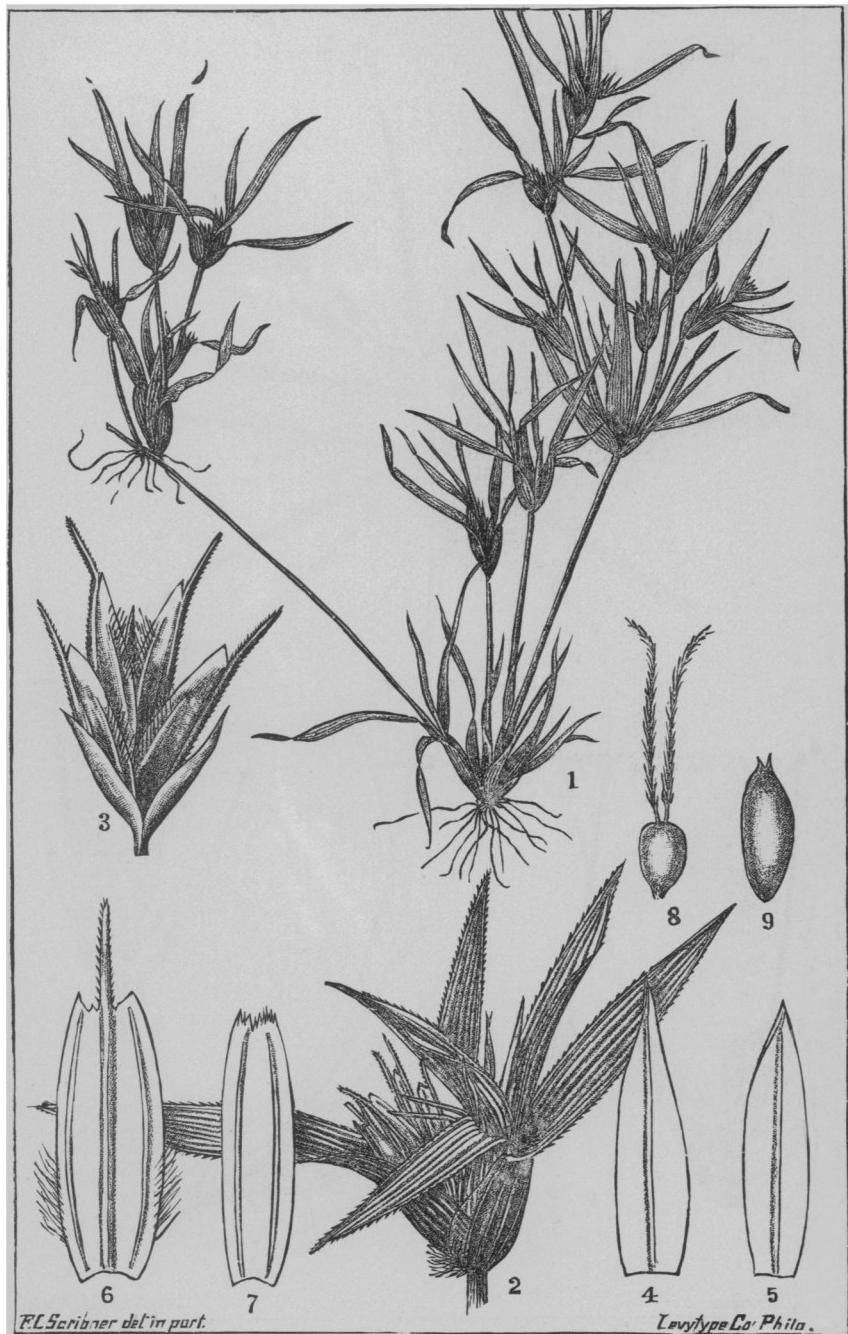
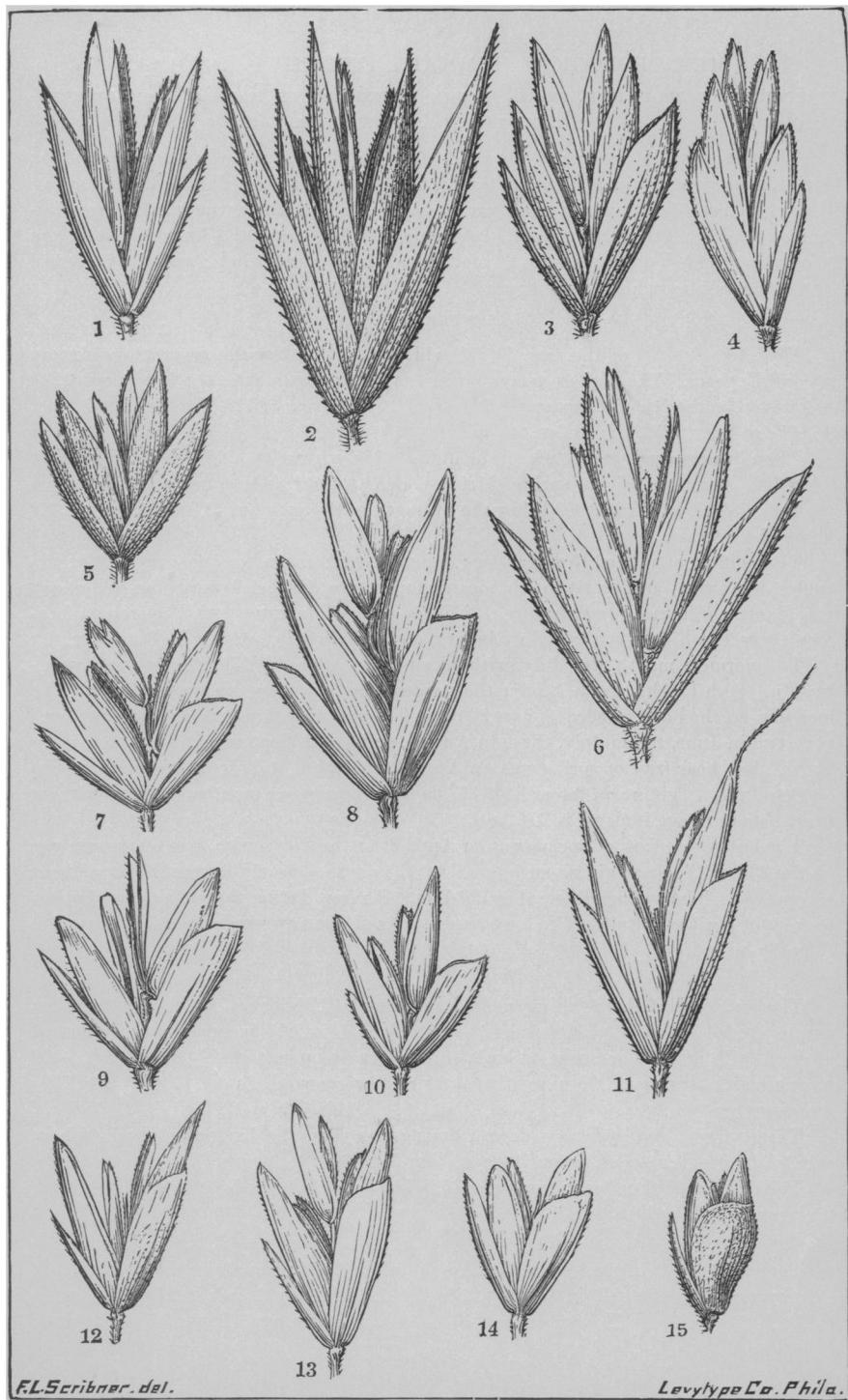


PLATE II.



METEOROLOGICAL SUMMARY FOR THE YEAR 1884.

PREPARED BY PROF. F. H. SNOW, OF THE UNIVERSITY OF KANSAS, FROM OBSERVATIONS TAKEN AT LAWRENCE.

The most notable features of the year 1884 were the low mean temperatures of the spring, summer and winter months; the high mean temperature of the autumn months; the very large rainfall, which came within half an inch of the extraordinary precipitation of the year 1876; the unusual percentage of cloudiness; the low velocity of the wind; the decided preponderance of south winds over north winds; and the increased percentage of atmospheric humidity.

TEMPERATURE.

Mean temperature of the year, 51.30° , which is 2.11° below the mean of the sixteen preceding years. The highest temperature was 98° , on July 8th; the lowest was 21.5° below zero, on the 5th of January, giving a range for the year of 119.5° . Mean at 7 A. M., 45.69° ; at 2 P. M., 59.40° ; at 9 P. M., 50.04° .

Mean temperature of the winter months, 24.19° , which is 5.71° below the average winter temperature; of the spring, 51.41° , which is 2.41° , below the average; of the summer, 73.05° , which is 3.05° below the average; of the autumn, 56.59° , which is 3.01° above the average.

The coldest month of the year was January, with mean temperature 20.99° ; the coldest week was January 1st to 7th, mean temperature, $.07^{\circ}$ below zero; the coldest day was January 5th, mean temperature, 12° below zero. The mercury fell below zero fourteen times, of which seven were in January, one in February, and six in December.

The warmest month was July, with mean temperature 76.93° ; the warmest week was July 20th to 26th, mean 79.66° ; the warmest day was July 8th, mean 86.87° . The mercury reached or exceeded 90° on 20 days, (one less than half the average number,) viz.: two in June, ten in July, three in August, and five in September.

The last hoar frost of spring was on April 24th; the first hoar frost of autumn was on October 8th; giving an interval of 167 days, or nearly six months, entirely without frost. The average interval is 154 days.

The last severe frost of spring was on April 8th; the first severe frost of autumn was on the 23d of October; giving an interval of 198 days, or nearly seven months, without severe frost. The average interval is 199 days. No frost during the year caused damage to crops of grain and fruit. The low temperatures of January were generally destructive to peach buds.

RAIN.

The entire rainfall, including melted snow, was 43.70 inches, which has been but once exceeded on our 17 years' record (in 1876), and is 9.05 inches above the annual average. Either rain or snow, or both, in measurable quantities, fell on 115 days—11 more than the average. On nine other days rain or snow fell in quantity too small for measurement.

There was no approach to a drouth during the year, the longest interval without rain in the growing season being 13 days, from July 30th to August 12th.

The number of thunder showers was 35. There was but one light hail storm during the year—on May 17th.

SNOW.

The entire depth of snow was 29 inches, which is 8.62 inches above the average. Of this amount, 12 inches fell in January, 2 inches in February, 1 inch in March, 6 inches in April, $1\frac{1}{2}$ inches in November, and $6\frac{1}{2}$ inches in December. Snow fell on 21 days.

The last snow of spring was on April 21st. The first snow of autumn was on November 18th—10 days later than the average date.

FACE OF THE SKY.

The mean cloudiness of the year was 47.56 per cent., which is 3.09 per cent. above the average. The number of clear days (less than one-third cloudy) was 146; half clear (from one to two-thirds cloudy), 116; cloudy (more than two-thirds), 104. There were 75 days on which the cloudiness reached or exceeded 80 per cent. There were 33 entirely clear and 43 entirely cloudy days. The clearest month was October, with a mean of 34.19 per cent.; the cloudiest month was December, mean 66.34 per cent. The percentage of cloudiness at 7 A. M. was 53.89; at 2 P. M., 49.76; at 9 P. M., 39.03.

DIRECTION OF THE WIND.

During the year, three observations daily, the wind was from the S. W. 266 times, N. W. 252 times, S. E. 201 times, N. E. 197 times, S. 76 times, N. 46 times, E. 37 times, W. 23 times. The south winds (including southwest, south and southeast) outnumbered the north (including northwest, north and northeast) in the ratio of 543 to 495.

VELOCITY OF THE WIND.

The number of miles traveled by the wind during the year was 131,188, which is 7,421 miles below the annual average for the eleven preceding years. This gives a mean daily velocity of 358.44 miles, and a mean hourly velocity of 14.93 miles. The highest hourly velocity was 75 miles, on June 25th; the highest daily velocity was 990 miles, on the 19th of January; the highest monthly velocity was 14,368 miles, in January. The three windiest months were January, March and April; the three calmest months were June, July, and August. The average velocity at 7 A. M. was 14.62 miles; at 2 P. M., 16.91 miles; at 9 P. M., 14.27 miles.

BAROMETER.

Mean height of barometer column, 29.111 inches, which is .006 inch above the annual mean. Mean at 7 A. M., 29.133 inches; at 2 P. M., 29.091 inches; at 9 P. M., 29.109 inches; maximum, 29.881 inches, on January 4th; minimum, 28.451 inches, on March 27th; yearly range, 1,430 inches. The highest monthly mean was 29.333 inches, in February; the lowest was 29.002 inches, in April. The barometer observations are corrected for temperature and instrumental error only.

RELATIVE HUMIDITY.

The average atmospheric humidity for the year was 72.6; at 7 A. M., 83.1; at 2 P. M., 55.8; at 9 P. M., 78.8. The dampest month was September, with mean humidity, 77.8; the driest month was March, mean humidity, 65.0. There were 28 fogs during the year. The lowest humidity for any single observation was 15 per cent., on March 12th.

The following tables give the mean temperature, the extremes of temperature, the number of inches of rain and snow, the number of rainy days, the number of thunder showers, the mean cloudiness, the relative humidity, the number of fogs, the velocity of the wind, the mean and extreme barometer heights, for each month of the year 1884, and a comparison with each of the sixteen preceding years.

YEAR 1884.

	<i>Min. barometer....</i>	<i>Max. barometer....</i>	<i>Mean barometer...</i>	<i>Miles of wind....</i>	<i>No. of fogs.....</i>	<i>Mean humidity....</i>	<i>Mean cloudiness...</i>	<i>Rainy days.....</i>	<i>Thunder storms...</i>	<i>Mean humidity....</i>	<i>Mean barometer...</i>	<i>Miles of wind....</i>	<i>No. of fogs.....</i>	<i>Mean humidity....</i>	<i>Mean barometer....</i>
<i>1884.</i>															
January ...	20.99	57.0	-21.5	1.28	12.0	0	41.42	78.9	3	14,368	29.313	29.881	28.735		
February ..	28.03	57.0	- 1.0	1.13	2.0	1	54.33	72.3	1	11,651	29.158	29.469	28.587		
March	41.56	73.0	12.0	2.73	1.0	5	58.37	65.0	2	14,229	29.054	29.465	28.451		
April	50.42	76.5	28.5	5.62	6.0	13	55.76	65.9	1	13,954	29.001	29.321	28.495		
May.....	62.24	85.0	36.0	3.57	0.0	12	50.54	68.9	2	9,978	29.046	29.299	28.689		
June.....	71.07	92.0	48.0	3.81	0.0	12	7	38.78	71.8	1	6,806	29.065	29.270	28.831	
July	76.93	98.0	60.5	5.18	0.0	15	41.67	71.7	1	8,733	29.004	29.289	29.809		
August.....	71.14	92.5	47.5	5.49	0.0	11	4	48.16	77.8	3	9,392	29.110	29.405	28.849	
September,	70.36	92.0	48.0	9.15	0.0	8	5	40.00	76.3	3	11,409	29.037	29.404	28.810	
October....	57.87	85.0	31.0	2.38	0.0	8	2	34.19	74.8	5	10,150	29.179	29.568	28.712	
November..	41.58	70.0	9.5	0.80	1.5	3	0	40.77	72.0	5	10,503	29.175	29.563	29.634	
December..	28.54	59.5	6.5	2.56	6.5	9	0	66.34	80.0	1	10,015	29.189	29.666	28.618	
Mean...	51.30	78.1	25.4	3.64	2.4	10	3	47.56	72.6	2	10,932	29.111	29.467	28.685	

SEVENTEEN YEARS: 1868-1884.

<i>Years.</i>	<i>Min. barometer....</i>	<i>Max. temperature...</i>	<i>Mean temperature...</i>	<i>Rain, inches.....</i>	<i>Thunder storms...</i>	<i>Snow, inches.....</i>	<i>Mean cloudiness...</i>	<i>Rainy days.....</i>	<i>Thunder storms...</i>	<i>Mean humidity....</i>	<i>Mean barometer...</i>	<i>Miles of wind....</i>	<i>No. of fogs.....</i>	<i>Mean humidity....</i>	<i>Mean barometer....</i>
1868...	58.36	101.0	-16.5	43	7	160	37.48	27.50	77	...	42.35	...	...	...	...
1869...	50.99	96.0	- 5.0	23	2	167	38.51	18.00	105	33	49.23	78.2	19	...	29.103
1870...	54.50	102.0	-10.0	51	6	197	31.32	9.50	100	27	47.88	68.4	13	...	29.097
1871...	54.30	103.0	- 6.0	48	8	218	33.23	29.75	120	24	47.37	65.9	6	...	29.076
1872...	51.90	97.0	-18.0	45	16	192	32.63	23.25	116	40	44.33	64.4	11	...	29.112
1873...	52.71	104.0	-26.0	48	9	165	32.94	26.50	101	17	42.46	64.0	6	154,508	29.093
1874...	54.20	108.0	- 3.0	58	2	187	28.87	43.00	99	20	45.54	65.7	14	145,865	29.121
1875...	50.60	99.0	-16.5	32	12	196	28.87	5.00	106	21	44.81	66.7	5	145,316	29.102
1876...	52.76	98.0	- 5.0	36	4	179	44.18	25.75	102	29	41.27	66.8	4	148,120	29.102
1877...	54.16	99.0	- 9.0	20	3	217	41.09	15.50	126	39	47.12	72.6	11	113,997	29.117
1878...	55.33	98.0	- 6.0	35	7	228	38.39	25.50	107	38	40.65	70.2	5	125,793	29.067
1879...	54.67	99.5	-16.0	48	13	203	32.68	10.35	90	36	40.01	67.1	10	124,758	29.127
1880...	54.01	101.0	-12.0	41	2	211	32.65	7.00	89	29	40.15	67.9	18	146,039	29.123
1881...	54.65	104.0	- 8.0	68	6	210	33.27	32.50	110	31	47.42	70.1	11	141,430	29.103
1882...	54.94	105.0	- 6.5	40	1	232	27.60	18.00	102	26	45.41	68.6	14	137,736	29.113
1883...	51.66	96.5	-14.0	26	8	217	40.65	12.50	106	32	45.24	69.7	18	141,164	29.135
1884...	51.30	98.0	-21.5	20	14	198	43.70	29.00	115	35	47.56	72.6	28	131,188	29.111
Mean,	53.29	97.8	-12.8	41	7	199	35.18	20.87	104	30	44.65	68.7	12	137,591	29.106